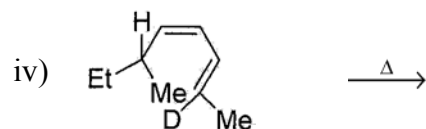
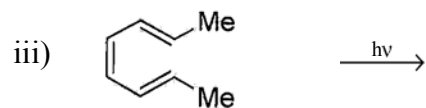
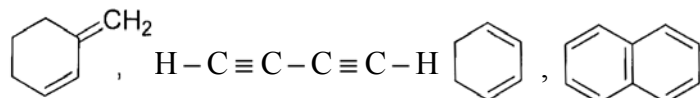


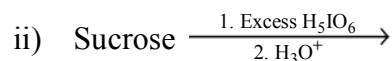
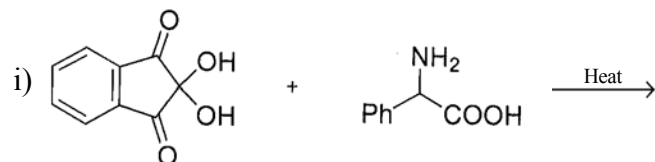
[4]



- c) Identify the compounds which would undergo Diels Alder reaction with maleic anhydride? Justify your answer. 2



4. a) Write the expected product(s) and explain each step mechanistically for the following reactions. 2+3



- b) How would you convert D-glucose into L-gulose. Mention reagents and reaction conditions and draw the product structure in each step with proper stereochemistry. 3
- c) Why DNA is called genetic material? Mention the key structural differences between DNA and RNA. 2

Ex/Core/Chem/TH/12/2022 (S)

B. Sc. CHEMISTRY EXAMINATION, 2022
(3rd Year, 5th Semester, CBCS, Supplementary)

CHEMISTRY (CORE)

PAPER – CORE CHEM-TH - 12

Carbocycles, Heterocycles and Cyclic Stereochemistry +
Pericyclic reactions and Biomolecules

Time : Two hours

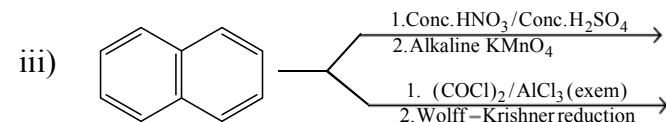
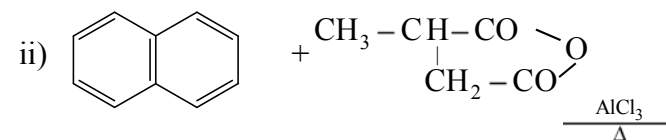
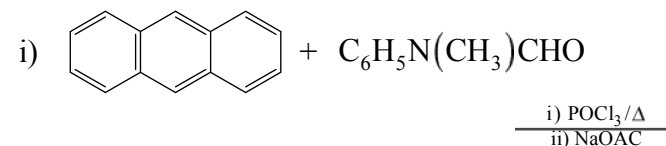
Full Marks : 40

(20 marks for each unit)

Use a separate answer script for each unit.

UNIT – 5121-O

1. a) Predict the product(s) with plausible mechanism of the following reactions (any two) : 2×2



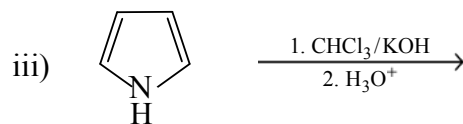
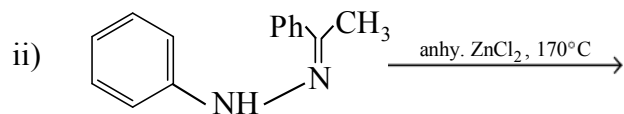
[Turn over

[2]

b) Answer **any two** of the following questions : $1\frac{1}{2} \times 2$

- Pyrrole undergoes electrophilic attack at C-2 position whereas indole undergoes electrophilic attack at C-3.
- Nucleophilic substitution in pyridine occurs readily at C-2 and C-4 positions.
- Discuss Knorr pyrrole synthesis and explain with mechanism.

c) Predict the product(s) with mechanism (**any two**) :

 $1\frac{1}{2} \times 2$ 

2. a) State whether the following statements are correct or not. Justify your answer. 2×3

- cis*-2-Chlorocyclohexanol forms epoxides when treated with base.
- cis*-4-*tert*-butylcyclohexanol undergoes faster

[3]

chromic acid oxidation compared to the corresponding *trans*-isomer.

iii) *Trans*-4-*tert*-butylcyclohexane carboxylic acid is a stronger acid than the corresponding *cis*-isomer.

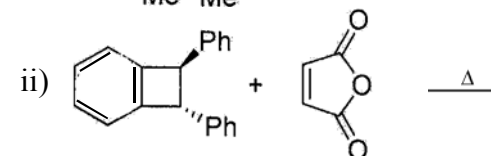
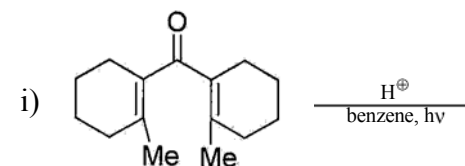
b) Pictorially depict the elements of symmetry present in the chair form of cyclohexane and deduce its symmetry point group. 2

c) Schematically illustrate how a racemic mixture of lactic acid, $\text{CH}_3\text{CH}(\text{OH})\text{COOH}$, can be resolved using (*S*)-1-phenyl-ethylamine as a resolving agent. Briefly explain the underlying principle of the technique used. 2

UNIT – 5122-O

1. a) Write down the Woodward-Hoffmann rules for electrocyclic reaction. 2

b) Predict the product(s) and suggest a mechanism of the following reactions. (answer **any three**): 2×3



[Turn over